

Great Green Macaw *Ara ambigua* collected in northwest Ecuador, with taxonomic comments on *Ara militaris*

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According to the literature (eg. Forshaw 1973, Meyer de Schauensee 1966) a substantial gap exists between the range of the nominate subspecies of *Ara ambigua* (Great Green, or Buffon's Macaw), which is not recorded definitely south of northern Chocó in northwestern Colombia (southernmost recorded locality apparently Nuquí), and *A.a. guayaquilensis*, known only from the type



Figure 1. Map of localities mentioned in the text. The shading shows the known distribution range of the Great Green Macaw *Ara ambigua*, the hatching the distribution of Military Macaw *Ara militaris*. Rio Sapayo and Rio Durango (Esmeraldas?) cannot be located. See the gazetteer of Paynter & Traylor (1977).

locality in the Chongon Hills, Prov. Guayas, of southwestern Ecuador (Fig. 1). That the species occurred in the intervening region was regarded as uncertain, though the discovery (Ridgely 1982) of 3 unpublished specimens in the AMNH from Río Sapayo and Río Durango was regarded as evidence that it probably was found there, at least formerly.

Its continued presence in northwestern Ecuador was substantiated when, on 26 October 1983, N.K., in company with Paul Greenfield, obtained a freshly shot specimen from a local hunter at El Placer, altitude 670 m, province of Esmeraldas, Ecuador. The locality is on the railroad, about half way between Lita (Imbabura) and San Lorenzo (Esmeraldas). The area is extremely humid with no dry season, and has been covered by tall, primary forest, which, however, at the present is being rapidly cleared. One or two pairs of unidentified large green macaws were seen flying over the forest almost daily during 3 visits in March 1979, October 1983 and July 1984.

There is now much less reason to doubt the sightings in the provinces of Pacaritambo in Los Ríos and Finca Victoria in Pichincha (Brosset 1964, Vuilleumier 1978), or the origin of the 3 specimens for Río Sapayo (Tapayo?) and Río Durango, both believed by Paynter & Traylor (1977) to be situated in Esmeraldas. Recent sightings (as late as 1985) show that the population in the Chongon Hills also exists, but is probably very small. There may no longer be any populations in the now almost deforested region between Esmeraldas and the Chongon Hills area. The habitat at the type locality of *guayaquilensis* is deciduous forest, though the birds regularly fly out into partially cultivated terrain in order to feed (Ridgely 1982).

TABLE 1

Measurements (in mm) of the maxillae of the *Ara ambigua* and *A. militaris* macaws

	length (chord)	width (at base)	depth (at base)
<i>Ara ambigua guayaquilensis</i>			
♀Guayas (AMNH, type)	63.3	30.2	31.5
♂R. Durango (AMNH 474249)	64.3	28.0	32.5
♀R. Sapayo (AMNH 474250)	66.8	28.0	34.2
♀R. Sapayo (AMNH 474251)	67.4	28.5	34.4
♀El Placer (ZMUC 80001)	67.0	30.5	34.1
All 5 specimens	63.3–67.4, \bar{x} 65.7	28.0–30.5, \bar{x} 29.0	31.5–34.4, \bar{x} 33.4
<i>Ara a. ambigua</i>			
7 from C. America	69.1–73.2, \bar{x} 70.5	29.9–33.0, \bar{x} 31.8	36.6–38.6, \bar{x} 37.4
13 from NW Colombia	64.3–77.4, \bar{x} 69.7	29.2–34.0, \bar{x} 31.2	33.6–39.4, \bar{x} 37.2
<i>Ara militaris mexicana</i>			
10 specimens	54.0–60.7, \bar{x} 57.1	25.4–28.9, \bar{x} 27.1	26.7–32.4, \bar{x} 29.3
<i>Ara m. militaris</i>			
2 specimens	52.3–55.9, \bar{x} 54.1	25.2–26.0, \bar{x} 25.6	26.0–27.2, \bar{x} 26.8
<i>Ara m. boliviana</i>			
4 specimens	53.4–55.9, \bar{x} 55.0	26.3–27.2, \bar{x} 26.8	26.3–30.2, \bar{x} 27.6

The El Placer specimen (ZMUC 80001 in the Zoological Museum of Copenhagen) was compared directly with 40 specimens of *Ara ambigua* (including the type of *guayaquilensis*) and the Military Macaw *Ara militaris* (including subspecies *mexicana*, *militaris* and *boliviana*) in the American Museum of Natural History (AMNH), the Academy of Natural Sciences of Philadelphia (ANSP), and Louisiana State University, Baton Rouge (LSU). ZMUC 80001 has a larger bill (see Table 1) and slightly yellower under wing-

coverts and underside to the primaries than the *guayaquilensis* type, but a darker green, less golden general coloration. It is thus as green as an *A. militaris* from Bolivia in ANSP. The El Placer bird's bill is also bigger than the smallest-billed *A.a. ambigua* from Chocó, Colombia. The 3 unpublished *guayaquilensis* specimens in AMNH are 2 females from Río Sapayo and a male from Río Duranga. The male and one of the females have the general coloration as green as the El Placer specimen. The male has the under wing-coverts slightly more ochre, the female slightly yellower. The other female has an underwing matching the El Placer bird, but a general coloration as golden as both the type of *guayaquilensis* and 20 specimens of nominate *ambigua*. On the basis of 5 available specimens, therefore, *guayaquilensis* seems to be rather variable in appearance.

When comparing the 5 specimens of *guayaquilensis* with the 20 nominate *ambigua* and 16 *A. militaris*, it became apparent that colour of the underside of the wings and tails varied so much within each form that it could not be used for distinguishing *A. militaris* from *A. ambigua* or from the latter's subspecies. Furthermore, the red on the forehead and tail, the blue in the wings and tail, and the amount and shade of maroon on the throat, foreneck, and mid-belly, are all subject to considerable variation in both subspecies of *A. ambigua*. This is of note, because these characters were used to separate the subspecies *A.m. boliviana* from nominate *A. militaris* by Reichenow (1908), though the subspecific distinctness of *boliviana* was soon doubted by Zimmer (1930) and later by Bond & Meyer de Schauensee (1943).

It has been supposed that *A. militaris* is in general a bird of deciduous forest and *A. ambigua* of humid forest (Forshaw 1973), but *A. militaris*, however, occurs in humid forest in eastern Peru and eastern Ecuador, and *A.a. guayaquilensis* in deciduous forest in western Ecuador; whereas in northern Peru *militaris* occurs both in deciduous (Koeppcke 1961) and humid (T. A. Parker) forests. Thus, there seems to be no difference between the habitats of these 2 species. The one real consistent difference is altitudinal, *A. ambigua* occurring entirely in the lowlands, while *A. militaris* is primarily montane.

There are 3 possible interpretations of the apparent intermediate position of *guayaquilensis* between the (golden-backed and large-billed) *A. ambigua* and the (green-backed and small-billed) *A. militaris*:— (1) It may be a race of *ambigua* which has converged towards *militaris*; (2) it could represent one or several small relict populations of a cline which once connected the 2 species; or (3) it could represent a hybrid population. The great individual variation is strongly in favour of the last interpretation. A most likely evolutionary scenario might be as follows:— (1) A proto-*A. militaris* dispersed through Central America and the tropical valleys of the Colombian Andes and southwards east of the Andes; (2) after range fragmentation, a geographically intermediate population in southern Central America or northern Colombia diverged, giving rise to *A. ambigua* by a "leapfrog" pattern (see Remsen 1984) of geographical variation; (3) during periods with more continuous forest habitat, the newly formed *A. ambigua* dispersed to western Ecuador and established breeding populations, which today possibly have relict characters; and (4) hybridization took place as *A. militaris* straggled across the Andes and formed mixed pairs with *A. ambigua*. That large green macaws do at least

occasionally wander substantial distances from their normal ranges is indicated by Ridgely's observation of one (species undetermined) in the coastal lowlands near Buenaventura, Colombia, on 10 January 1983. Trans-Andean dispersal of *Ara militaris* is known to occur at the Mara  n deflection in northern Peru (Koeppke 1961), and may occur in Nari  o, southern Colombia, as well.

The ranges of the 2 macaws come closest in Colombia (Haffer 1975), but even here they are not known to be sympatric. Military and Great Green Macaws have therefore been considered closely related allospecies (Ridgely 1982). The present analysis of the west Ecuador population seems to indicate that this may not actually be the case, though we are not yet in a position to state authoritatively that the 2 taxa are in fact conspecific. Hopefully, a more detailed future mapping of the distribution and morphological variation of Great Green Macaws in Ecuador, and of the seasonal and geographic occurrence of Military Macaws west of the Andes will shed further light on the problem.

Nevertheless, the great individual variation among the 5 West Ecuadorian specimens of *guayaquilensis* and the morphological overlap, both in bill-size and colours, with nominate *ambigua* makes it difficult to accept *guayaquilensis* as a valid race. We therefore propose synonymizing it.

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